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he may ride up in the head-gust, with the constraining device thrown off, to a height of some $4J$ and then, with the device working, need drop only about J in the rear-gust. In this manner he can gain the amount $3J$ in altitude during each period. To avoid interference the successive maxima of the gusts should be at least 30 seconds apart for this machine.

¹ G. H. Bryan, *Stability in Aviation*, Macmillan, 1910; L. Bairstow, *Technical Report of the Advisory Committee for Aeronautics*, London, 1912-13; J. C. Hunsaker, these PROCEEDINGS, 2, 278 (1916).

² A general lecture by Glazebrook, *Aeronautical Journal*, 272-301, July, 1914, should be cited.

TERMS OF RELATIONSHIP AND SOCIAL ORGANIZATION

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Some years ago Kroeber undertook to show that terms of relationship are linguistic and psychological phenomena.¹ Recently Rivers has attempted to overthrow this view completely, and holds that they are sociological phenomena, and consequently that it is entirely possible to infer marriage customs and social organization from these terms.² Lowie lately has to a certain extent followed Rivers; he has not followed the latter's survival-theories,³ and it is doubtful if many American ethnologists will do so.⁴

In this paper I wish to develop Kroeber's thesis from a different angle, and also to make a point on my own account. Long ago Morgan saw that for the most part the terms of relationships are identical in all Algonquian languages with phonetic changes, and consequently for the greater part must go back to the original parent language.⁵ Now insofar as this is the case, to this extent terms of relationship are linguistic phenomena. For example, the Fox are organized in exogamic gentes with descent in the male line, and the Plains Cree have no gentile organization at all, yet have at least seventeen terms of relationship in common with the Fox. Again the Delaware who are organized in exogamic clans with descent in the female line have some terms of relationship in common with both the Fox and Cree. Similarly the Shawnee who have an entirely different organization from any of the above mentioned Algonquian tribes,⁶ nevertheless have many terms in common with Plains Cree and Fox, and some with Delaware. Accordingly it is obvious that social organization is not the sole factor in terms of relationship. It may be objected that though Plains Cree and Fox possess

many terms in common, yet they are not all used with the same meaning, and that the difference in social organization is responsible for this. For example Plains Cree and Fox have a term in common for 'my daughter,' but in Fox a male speaker can apply it to his brother's daughter also, whereas in Plains Cree he cannot. To this we reply that though both the Ojibwa and Fox are organized in exogamic gentes with descent in the male line and possess a number of terms of relationship in common, nevertheless all the terms are not used with the same meaning. An example is the term for 'my father' which is common to both Fox and Ojibwa as well as to numerous other Algonquian tribes, but which can be used in Fox also with the sense of 'my paternal uncle' though it cannot be so used in Ojibwa where an entirely distinct word is used for this latter meaning. So it is clear that difference in social organization by itself will not satisfactorily account for the different usage of the same term in Plains Cree and Fox. When it is further noted that Ojibwa, Ottawa, Algonkin, Potawatomi, and Cree share in common words for 'my brother's son' and 'my brother's daughter,' with a male speaker in each case, as opposed to Sauk, Fox, Kickapoo, Shawnee, Menominee, Peoria and closely allied dialects—all of whom employ the common Algonquian words for 'my son' and 'my daughter' respectively for the above—it becomes clear that we have to deal with linguistic phenomena. For it will be remembered that Cree-Montagnais, Menominee, Sauk, Fox, Kickapoo, and Shawnee, form one sub-division of Central Algonquian dialects and Ojibwa, Ottawa, Algonkin, Potawatomi, Peoria and closely related dialects another such sub-division.⁷ Adequately to account for the divergent distribution of the terms in question we must assume that Cree has bodily borrowed them from Ojibwa, and that Peoria and closely related dialects under the influence of Sauk, Fox, etc., have extended the meanings of the terms for 'my son' and 'my daughter' to include also 'my brother's son' and 'my brother's daughter' (with male speaker in each case) respectively. In other words, in the latter case a category has been taken over. The geographical distribution of the tribes mentioned distinctly favors these hypotheses. It is another linguistic question as to which of the two sets of terms represents the hypothetical Algonquian parent-language most closely. The fact that Delaware and Munsee, who are organized in exogamic clans with descent in the female line, and who form a distinct sub-division of the Central Algonquian dialects, and Micmac, a somewhat divergent member of Eastern Algonquian dialects, agree with Sauk, Fox, etc., tends to show that the latter represent the primitive

Algonquian state as opposed to Ojibwa, etc.⁸ This is exactly what might have been anticipated, for the sub-division represented by Cree-Montagnais, Menominee, Sauk, Fox, Kickapoo, and Shawnee in many respects linguistically is more archaic than the subdivision represented by Ojibwa, Ottawa, Algonkin, Potawatomi, Peoria and closely related tribes.⁷ This applies especially to the first four dialects of the latter sub-division.

I spoke above of the borrowing of categories to explain certain terms of relationship. But this was within a single linguistic stock. Now as some members of both the Iroquoian and Siouan stocks have systems of consanguinity that in certain respects are identical with those of some members of the Algonquian stock, and at the same time geographically are contiguous to them, I do not think it likely that this is merely the result of accident. In short we have borrowing of categories across linguistic stocks. I mention this to show how inadequately social organization by itself can account for the terms of relationship of Algonquian languages.

Again the Piegan, a member of a linguistically divergent major group of Algonquian tribes, who are apparently organized in gentes in the making, have practically no terms of relationship that are the phonetic equivalents of those of the central group. Nor do the categories correspond with theirs. It is difficult to see how this is due to the social organization of the former. It will be borne in mind that the Plains Cree are if anything looser in organization, and yet have the old terms of relationship. It will be recalled that Cree in many respects is an archaic Algonquian language.⁷ On the face of it, it looks as if we again had a linguistic problem.

Summing up, we must say that from the point of view of Algonquian tribes terms of relationship are linguistic and disseminative phenomena. But I do not deny that in other cases they may be primarily psychological and sociological. We have no right to generalize from a single stock and apply our conclusions everywhere. When some dozens of stocks shall have been analyzed somewhat on the above plan, it may be possible safely to generalize. Till then we have every reason to believe that all the factors have played a rôle in kinship-terms.

¹ *J. R. Anthropol. Inst. G. B. I., London*, 39, 77-84.

² *Kinship and Social Organization*, London, 1914; *The History of Melanesian Society*, Cambridge, England, 1914.

³ These PROCEEDINGS 1, 346-349; *Amer. Anthropol., New York*, N. S., 17, 223-239. However Lowie makes an exception in the case of the Cree terms of relationship which, he thinks,

points to the fact that the Cree once possessed exogamous gentes with descent in the male line. How unnecessary this hypothesis is, is shown in this paper.

⁴ See *Amer. Anthropol., New York*, N. S., 17, 329-340; *Ibid.*, 588-591; per contra, *Ibid.*, 175-177.

⁵ *Smithsonian Contributions to Knowledge*, No. 218, p. 217.

⁶ According to my unpublished information.

⁷ *Smithsonian Inst., Rep. Bur. Amer. Ethn.*, 28, 221-290b.

⁸ We are confirmed in this belief by the fact that the Atsina, a member of a linguistically divergent major group of Algonquian tribes, organized in non-totemic exogamous gentes with descent in the male line employ the same words for 'my son' and 'my daughter' as they do for 'my brother's son' and 'my brother's daughter' respectively, with male speaker in the latter cases. The word for 'my daughter' is the common Algonquian one; that for 'my son' apparently is not old.

REPORT OF THE ANNUAL MEETING

Prepared by the Home Secretary

The sessions of the Annual Meeting of the National Academy of Sciences were held in the United States National Museum, Washington, D. C., on April 17, 18, and 19, 1916.

Seventy-two members were present as follows: Messrs. C. G. Abbot, Allen, Ames, Becker, Boltwood, Britton, Bumstead, D. H. Campbell, Cannon, Cattell, W. B. Clark, F. W. Clarke, F. M. Clarke, Comstock, Conklin, Coulter, Cross, Dall, Davenport, Davis, Day, Donaldson, Fewkes, Flexner, Hague, Hale, E. H. Hall, Harper, Hayford, Hillebrand, Holmes, Howell, Iddings, Jennings, Leuschner, Lillie, Loeb, Lusk, Mall, Meltzer, Mendel, Merriam, Merritt, Milliken, More, Morley, H. N. Morse, Moulton, E. L. Nichols, A. A. Noyes, Parker, Pickering, Pupin, Ransome, Reid, Remsen, Rosa, Schuchert, Scott, E. F. Smith, Story, Van Hise, Van Vleck, Walcott, Webster, Welch Wheeler, David White, H. S. White, Wilson, R. W. Wood, Woodward.

BUSINESS SESSIONS

The President announced the following deaths since the last Annual Meeting of the Academy:

JOHN ULRIC NEF, died August 13, 1915, elected in 1904.

FREDERICK WARD PUTNAM, died August 18, 1915, elected in 1885.

ARTHUR W. WRIGHT, died December 19, 1915, elected in 1881.

EUGENE W. HILGARD, died January 8, 1916, elected in 1872.

PAUL EHRLICH, foreign associate, died August 20, 1915.

REPORTS FROM OFFICERS OF THE ACADEMY

The reports of the President and Treasurer for the year 1915 were presented to the Academy in printed form as transmitted to the Senate of the United States by the President of the Academy.

The report of the Home Secretary was presented as follows: